

REMARKS

Claims 1-15, 28-32, 47-49 and 51 will be pending upon entry of this Amendment. This Amendment cancels claims 16-27 and 50. In the Final Office Action, pending claims 1-11, 15, 28-32 and 47-51 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. patent 6,331,365 ("King"), and pending claims 12-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over King. Applicant respectfully traverses these rejections for reasons discussed below.

I. The King Reference

King discloses a power system for an electric motor drive that can be used to propel an electric vehicle. For purposes of this response, a representative embodiment of the King system is shown at Fig. 4 of King. As shown at Fig. 4, the system includes an energy battery 24, a power battery 48 and a motor 16. Electrically interposed between the energy and power battery is a boost converter 34. The boost converter 34 boosts the voltage of the energy output from the energy battery before it is received by the power battery. The boost converter 34 allows the energy battery 24 to recharge the power battery 48, despite the fact that the energy battery 24 is preferably of a lower voltage level than that of the power battery 48.

According to King, here is how the boost converter works:

The boost converter circuit 34 is a simplified version of that shown in U.S. Pat. No. 5,710,699 and essentially comprises an inductor 38 connected in the positive DC link voltage bus and a semiconductor switching device 40 connected cross the DC link. The term DC link 14 is used herein to refer to the positive and negative DC busses which have portions at different voltage levels due to boost converter 34 (and due to battery 48 in FIG. 4). Each of the portions is collectively included in DC link 14.

A reverse current diode 42 is connected in reverse polarity in parallel with the switching device 40. The boost converter 34 operates by gating the switching device 40 into conduction so as to effectively place the inductor 38 directly across the terminals of the battery 24. This action causes a rapid build up of current in the inductor. When the switching device 40 is then gated out of conduction, the inductive reactance of the inductor 38 forces the current to continue to flow in the same direction through the inductor so that the inductor acts as a current source creating a voltage across the combination of the battery 24 and inductor 38 which is greater than the battery voltage. This forces the current to continue through the series diode 26 and raises the effective voltage on the DC link 14. The reverse

current diode 42 provides a current path for transient voltages when the device 40 is gated out of conduction so as to protect the device 40.
(King at col. 4, lines 3-27.)

One reason that the energy battery of King has a lower voltage than the power battery is to prevent power flow from the energy battery to the power battery except as regulated by the interposed boost converter. (See King at col. 5, lines 15-20.)

II. Claims 1 And 28 And Their Dependent Claims

Claim 1 sets forth a system that recites “a first rechargeable energy battery having a first total impedance” and “a second rechargeable power battery having a second total impedance, less than the first total impedance.” Method claim 28 recites similar language to this quoted language from claim 1. Although King does disclose a system including a power battery and an energy battery (see King at Fig. 4, ref. nums. 24, 48), King does not teach or suggest that its power battery has a lower impedance than its energy battery. In fact, King does not mention impedance at all. Therefore, King does not teach or suggest the quoted claim language. For this reason, claims 1-15 and 28-32 are patentable over King.

III. Claim 4

Claim 4 further recites that “the battery controller initially connects the power battery and energy battery in parallel.” This is not taught or suggested by King because King interposes a boost converter between its energy battery and its power battery as explained above. (See King at Fig. 4, ref. num. 34.) Beyond the fact that King does not utilize a parallel connection between its energy and power batteries, King effectively teaches away from such a parallel connection because King discloses that the power and energy batteries are at different nominal voltages, making them unsuitable to be connected in parallel. For this additional reason, claim 4 is patentable over King.

IV. Claim 6

Claim 6 further recites that “the power battery and energy battery have a range of overlapping nominal voltages.” This is not taught or suggested by King because, as explained above, King’s power and energy batteries are at different nominal voltages, voltages different

enough to require a boost converter to be interposed between the batteries. For this additional reason, claims 6-8 are patentable over King.

V. Claim 7

Claim 7 further recites that “the power battery and energy battery are connected in parallel with the driving motor.” This is not taught or suggested by King at least because King interposes a boost converter between its energy battery and its power battery as explained above. As shown at Fig. 4 of King, its energy battery is not connected in parallel with either its power battery nor its motor. Beyond the fact that King does not utilize a parallel connection between its energy and power batteries, King effectively teaches away from such a parallel connection recited in the present claims at least because the power and energy batteries of King are at different nominal voltages, making them unsuitable to be commonly connected in parallel with a motor. For this additional reason, claims 7 and 8 are patentable over King.

VI. Claim 47

Claim 47 sets forth a vehicle that recites “the first battery is spatially proximate to the motor and the second battery is spatially remote from the motor.” King does not discuss at all the spatial location of its power battery (first battery) or its energy battery (second battery). Therefore, King does not teach or suggest the quoted claim language. For this reason, claims 47-49 are patentable over King.

VII. Claim 51

Claim 51 sets forth a vehicle that recites “a battery connection device structured and located to electrically connect each of the first battery and the second battery to the motor and the second battery in parallel, whereby the first and second batteries can both supply electrical energy to the motor through the parallel connection, and whereby the first and second batteries can both receive electrical energy from regenerative braking portion of the motor through the parallel connection.” King does not teach or suggest that its energy battery is connected in parallel to its motor at least because, as explained above, a boost converter is interposed between the energy battery of King and its power battery and motor. Although King does disclose regenerative braking, the energy battery of King is prevented from receiving electrical energy

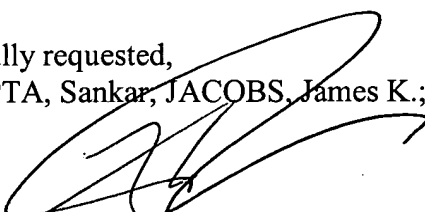
from the regenerative braking by the boost converter. (See King at col. 3, lines 40-45 and col. 4 at lines 33-35.) Therefore, King teaches and suggests neither the parallel connection, nor the receipt of regenerative braking energy by a "second battery" as recited in the above-quoted claim language. The presence of the boost converter in King strongly teaches away from the quoted claim language. For this reason, claim 51 is patentable over King.

VIII. Conclusion

It is submitted that the foregoing amendments and/or explanations are sufficient to put this application in condition for allowance. If the Examiner disagrees, the Examiner is encouraged to call the undersigned at 1-416-961-5000 to expeditiously resolve any outstanding issues.

It is hereby petitioned under 37 CFR 1-1336 that the response term of this application be extended, as necessary, to permit entry of the present amendment and the RCE under 37 CFR 1.114. The Commissioner is hereby authorized to charge any necessary extension fee to deposit account no. 18-1350, under an order number corresponding to attorney docket number P63902.

Respectfully requested,
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